

Attachment 3

Work Plan

Rohner Creek Flood Control and Riparian Habitat Improvement Project

Introduction

The City of Fortuna Rohner Creek Flood Control and Riparian Habitat Improvement Project (the project) is located in heart of the City of Fortuna between the Main Street and 12th Street. Historic modifications, channelization and urban encroachments into the lower reaches of Rohner Creek have contributed to the increase in flood frequency throughout the City of Fortuna as well as the degradation of instream habitat necessary to support the spawning and rearing of native stocks of Salmonids. Integrating multiple objectives including flood control, aquatic and riparian habitat restoration, and seismic upgrades to bridge crossings, this proposed watershed-based, channel corridor-scale project will focus on decreasing flood frequency within the City limits while restoring riparian corridor habitats in a constraining urban landscape.

The project is intended to provide immediate and substantial improvements to channel corridor function that will benefit aquatic organisms and reduce flood frequency within the City of Fortuna. Rohner Creek, at its confluence with Strongs Creek (located approximately 1,000-feet upstream from the Eel River), has a 4.5 square mile watershed ranging in elevation from 25 to 1,600 feet. The upper portion of the watershed is predominately comprised of second and third-growth redwood forest, whereas the mid-portion consists of rural residential areas. The lower portion of the watershed is comprised of residential, commercial, and industrial land uses and within the City limits of Fortuna. Through historic channelization and encroachments, Rohner Creek through the urbanized reach of Fortuna experiences overbank flows on a 1.5-year recurrence. Historic attempts to reduce flooding throughout the corridor have resulted in the absence of complex and diverse instream habitats suitable to support native stocks of Salmonids including Chinook Salmon, Steelhead Trout, and the State and Federally listed Coho Salmon.

The proposed project is taking a channel corridor approach in identifying opportunities to integrate habitat enhancement elements with flood reduction improvements through the 1-mile project corridor within the City of Fortuna. As discussed below, conceptual design-level hydrologic, hydraulic and geomorphic analyses are currently being used to evaluate a suite of improvement opportunities throughout the project corridor. These improvements will address localized streambank mass wasting, channelization, and the absence of Salmonid habitat elements throughout the corridor. These improvements will benefit ecological and hydraulic function of the corridor focusing on instream features and riparian plantings that will improve corridor habitats while reducing flood frequency. One of the primary purposes of the project is to reduce flooding and the resulting recurring damage to residential and commercial properties in one of the most constrained areas between Main Street and 12th Street.

This project is a high priority for the City of Fortuna. The City has committed funds for this project in the City's Capital Improvement Plan for the last several years, and the obtainment of the Prop 1E Stormwater Flood Management Grant will help the City find the political will to spend their share of the project funds, which have been programmed in for several years.

Goals and Objectives

The goal of the proposed project is to reduce flood frequency and associated flood damage completely for the 10-year recurrence event and reduce the extent of damage from larger flood events and other natural disasters (earthquakes), while improving in-stream habitat to support native fisheries. The specific objectives of this project are:

- Maximize channel conveyance to provide flood protection for the 10-year recurrence flow
- Reduce property damage in a blighted Redevelopment Area that results from flood events
- Reduce seismic vulnerable to stream blockages which can increase flooding
- Increase diversity and complexity of instream habitat suitable for Salmonids
- Increase native composition of riparian species
- Minimize disturbance and impacts to adjoining property owners
- Reduce sediment loads and improve water quality

Purpose and Need

The purpose of the proposed project is to reduce flood related damages in downtown Fortuna between Main Street and 12th Street where flooding currently occurs on a regular (on average every two years) basis. This project is needed by the community to prevent continued property damage to homes and businesses in this area of town. The paragraphs below describe how the project is consistent with the North Coast Integrated Regional Water Management Plan (NCIRWMP).

Urbanization, historic channelization and corridor encroachments have contributed to the current absence of suitable habitat elements to support native salmonid populations in the lower reach of Rohner Creek. The proposed project will re-introduce instream salmonid rearing and refugia habitat where acceptable and sustainable, and increase riparian canopy to promote corridor shading to enhance salmonid populations, which supports the NCIRWMP's objective of enhancing native salmonid populations by restoring required habitats.

The proposed restoration and water quality improvement elements are consistent with multiple beneficial uses specified in the North Coast Region Basin Plan and supports the implementation of TMDLs by reducing sediment inputs to the lower Eel River, which is listed on the State's 303(d) list of impaired water for impairments due to sedimentation/ siltation, and is also an objective of the NCIRWMP.

Another objective of the NCIRWMP met by the proposed project is to address issues related to disadvantaged communities. The City of Fortuna is a disadvantaged community, with a median

household income of \$31,129, which is 65% of the State of California's MHI, according to data derived from the 2000 US Census. The project is located in one of the City's several Redevelopment Areas. The proposed project area was classified as blighted and needing relief due to the reoccurring flooding that happens and continued damage to properties

Lastly the project does have a minor benefit to the NCIRWMP's goal to reduce greenhouse gas emissions. The proposed project will include native riparian planting through the channel corridor that will capture carbon by taking in atmospheric Carbon Dioxide (CO₂), converting it to plant mass through photosynthesis, and then sequestering the carbon in the soils that form as plant matter. This project component also contributes to the State's efforts to reduce greenhouse gas emissions, mandated through AB 32 and SB 375.

Integrated Elements of Projects

This project effectively integrates flood control with in-stream habitat improvements while also providing water quality benefits in a disadvantaged community, as discussed under the purpose and need above.

Regional Map

Figure 3.1 included at the end of this attachment shows the requested information for the Regional Map. The project will provide at a minimum protection from the 10-year storm event. The project is not located in the State Plan of Flood Control, as discussed further below. Figure 3.2 shows the existing flood management infrastructure from the City's 2005 Storm Drain Master Plan. Figure 3.3 is an excerpt from the Humboldt County Hazard Mitigation Plan, which shows the probability of peak ground acceleration in the area.

Completed Work

The City initiated work on this project in 2009. Task 5, Preliminary Hydrologic and Hydraulic Model Development and Analysis, described below was completed in July of 2009. This analysis enabled the City to identify data gaps and allowed for collection of additional data in support of the next phase of work. The City is in the process of completing Task6, Final Hydrologic and Hydraulic Model Development, also described below, which will result in calibrated hydrologic and hydraulic model of Rohner Creek and up to six feasible alternatives for flood reduction.

Existing Data and Studies

The proposed project was identified in the City of Fortuna's 2005 Storm Drain Master Plan. Since then the City programmed funds for the project as part of the City's Annual Capital Improvement Planning Process. In 2009 the City embarked on an effort to develop preliminary hydrologic and hydraulic models of Rohner Creek. That effort was expanded on in 2009 and 2010. Starting in Fall of 2009 the City installed a permanent stream gaging station to monitoring flows as well as three pairs of crest gages to document peak flow water depths. The City now has calibrated hydraulic (HEC-RAS) and hydrologic (HEC-HMS) models of Rohner Creek focused on the area between Main Street and 12th Street. The model has been used to demonstrate feasibility that the current proposed project consisting of channel

improvements to increase capacity will reduce flood frequency and eliminate flooding during the 10-year recurrence flow in the project area.

The City completed a Redevelopment Plan in 1989. The project area in Rohner Creek was identified as a top priority for flood control to reduce blight due to flooding in the area. The City voters approved bond for stormwater project in October of 2007, which have finally provided the City a portion of the funds needed to make progress of the Rohner Creek and other flood control projects in the City.

Project Map

Figure 3.4 shows the proposed project layout.

Project Specifics

Figure 3.1 included in this attachment shows the regional location of the Project. It is contained entirely within the Eel River watershed which drains directly to the Pacific Ocean. The project does not impact, nor have any influence on the Sacramento River Flood Control Project or Sacramento River or San Joaquin River watersheds, and is thus not part of the State Plan of Flood Control. This project was discussed with DWR's Prop 1E grant staff who stated they will confirm that the project is not located in the State Plan of Flood control.

The proposed project would not have any negative impacts on existing stormwater or sewer conveyance systems. The reduction in flood events has the potential to reduce the pressure the stormwater conveyance systems experiences during overland flooding events.

Project Timing and Phasing

The construction period will be limited by instream work windows which are generally between June 15th and October 15th. It is anticipated that the project could be constructed in its entirety within this 4-month period of time. If necessary to accommodate permitting and right-of-way and negotiations, the project could however be completed in two separate seasons.

PROJECT TASKS

This section describes the tasks necessary to complete the project. In some instances work already completed as discussed above is included in the task list to show how the previous work is related to the project proposed for DWR funding, and to document to dollar expended by the City thus far to be included as part of the City's cost match.

Budget Category (a): Direct Project Administration Costs

Task 1: Administration and Project Reporting

This task includes monitoring the project budgets and schedule, conducting project team meetings, implementing the quality assurance/quality control programs (QA-QC), communicating with the project funders, regulatory agencies, landowners, and other stakeholders, and preparation of reimbursement requests with supporting documentation.

This task also includes both quarterly reporting throughout the life of the grant as well as completion of the final report. Quarterly reports will provide an overview of the project budget and a progress report which will describe activities undertaken and accomplishments of each task during the quarter, milestones achieved, and problems encountered in the performance of the work under the agreement. The description of activities and accomplishments of each task during the quarter shall be in sufficient detail to provide a basis for payment of invoices. An annual report for each year of the grant will also be prepared which will summarize the information included in the quarterly reports for the year and present an updated project schedule and items planned for completion in the coming year.

Once the project is complete, a Final Report will be prepared. The report shall include the following narrative sections: An introduction section including a statement of purpose, the scope of the project, and a description of the approach and techniques used during the project; A list of the task deliverables; And Determination of whether the purpose of the project has been met. Information collected in accordance with the project monitoring and reporting plan will be presented, including photo monitoring. The project activities will be summarized and achievements and difficulties will also be presented. A draft of the final report will be provided to the State 60 days before the end of Grant Agreement. Comment period on draft will be 30 days and the Final Report will incorporate comments to the extent possible or provide explanation to comment source.

Deliverables:

Reimbursement requests, other project communications to DWR, Submission of quarterly, annual and final reports meeting DWR requirements

Task 2: Labor Compliance Program

The City regularly works with the Redwood Community Action Agency (RCAA), a non-profit organization, who has a labor compliance plan approved by the Department of Industrial Relations (DIR), for labor compliance services. The City anticipates sub-contracting labor compliance to RCAA for this project as well.

Deliverable: Submission of contract with RCAA and a copy of RCAA's approved Labor Compliance Program

Task 3: Project Performance Plan

Under this task the City will work with DWR to finalize the performance measures proposed in the DWR funding application. The performance monitoring plan that will address, at a minimum, the following elements: Identify project performance goals related to the design, permitting and construction of the channel improvements and potential bypass; Define performance indicators for each phase of the project.; Identify the method, frequency and schedule for collection of monitoring data; Identify the party responsible for each phase of the project; Prepare a Draft Monitoring Plan; Provide a copy to stakeholders; Revise Monitoring Plan as per agency recommendations; Prepare Final Monitoring Plan

Once the performance measures, monitoring systems, and targets are finalized, the monitoring of the implementation of the project performance plan will be conducted under this task.

Deliverables:

Final Project performance Plan. Post-project performance results to be included in Final Report under Task 1.

Budget Category (b): Land Purchase/Easement

Task 4: Develop Land Easements and Rights of Way

This task will be completed once the selection of the best apparent alternative is complete, which takes into consideration easements needed to implement the project. Under this task, the City will work with land owners to present the benefits of the flood control and riparian habitat improvement project. The City has already started this effort through discussions at City council meetings. The City already owns significant amounts of land between Main Street and Beech Avenue in which to add capacity to Rohner Creek, and depending on the final selected alternative, may not need additional permanent right of way, although temporary construction easements will be needed. The City anticipates most landowners would prefer a land easement instead of the City purchasing right of way. However, the City is open to whichever option is preferred by the land owner and will move the project forward.

Under this task, the City will work with land owners to obtain the right of way necessary for the selected project. A legal agreement between the City and the land owners will be developed for both temporary construction easements and needed permanent easements. If necessary, purchase agreements to transfer ownership of needed land will also be developed under this task. Most of the survey work in support of the easements will be completed under the preliminary design task, however it is anticipated that some additional survey will be needed for specifically in support of finalizing easement documents. Appraisal services to compensate land owners will be performed under this task. Lastly easements will be recorded with the Humboldt County office of records.

Deliverables:

Copies of Property/ Easement Appraisals and Executed Easement Agreements filed with Humboldt County Recorder's Office.

Budget Category (c): Planning/Design/Engineering/Environmental Documentation

Task 5: Preliminary Hydrologic and Hydraulic Model Development and Analysis

Under this task, the City of Fortuna completed a preliminary hydrologic and hydraulic models on Rohner Creek to assess the general feasibility of two flood control alternatives that had been under consideration as a means to reduce flood damage. The preliminary models were used to evaluate the feasibility of a bypass and/or detention basin that would decrease flooding of Rohner Creek during a 100-year flow recurrence between Main Street and South 15th Street.

As part of the evaluation of the detention basin option, groundwater elevations were monitored for four consecutive weeks in April and May 2009 and again on July 23, 2009. A wetland determination was conducted at the proposed detention basin site, following the Army Corps of Engineers (ACOE) wetland determination methodology. There is an absence of wetlands at the discrete observed locations; however the drainage ditch that parallels the eastern and southern property lines could be considered a wetland by the ACOE.

A HEC-HMS Hydrologic Runoff Model was developed for the Rohner Creek watershed and results from a 24-hour rainfall event with a 10-, 50-, and 100-year recurrences were compared to the peak flows presented in the 1982 FEMA Flood Insurance Study (FIS). The HEC-HMS peak flows were similar to the FIS peak flows, with a difference resulting from the different hydrologic methods used in each study as well as the variation in watershed areas based on recent development. The peak flows generated using the HEC-HMS model represent current land use conditions and are the peak flows used for evaluating flood control alternatives.

A HEC-RAS hydraulic model of Rohner Creek was developed from the City corporate limits to the confluence of Strongs Creek based on data from FEMA's existing 1979 HEC-2 hydraulic model of Rohner Creek. The HEC-RAS model water surface elevations were compared to the 1979 HEC-2 model water surface elevations. The results were similar, with the greatest variation occurring at the crossings which is likely explained by the different conveyance and bridge calculation routines between the two models.

Utilizing the HEC-RAS model, a maximum existing channel capacity of 300-cfs was determined for Rohner Creek near Stillman Way (just south of Main street) and was consistent with the 2005 Storm Drainage Master Plan results. The difference between this maximum capacity channel flow and the HEC-HMS 100-year flow (approximately 1,206-cfs) was used as the basis for conducting the hydraulic analyses of the two proposed alternatives.

Detention storage analyses were conducted to determine the approximate volume necessary to detain the 100-year flow in excess of the 300-cfs channel capacity. The results indicated that a detention basin

at the high school is not feasible due to necessary size, approximately 247 acre-feet, to store the required volume in comparison to the available three acre-feet at the proposed High School site.

The bypass channel alternative was sized to convey the flow balance of 900-cfs. This alternative was found to be feasible from a hydraulic standpoint and is considered further in the next phase.

Deliverables:

Draft Rohner Creek Preliminary Flood Control Study. This study was completed in July 2009. The Draft report described the results of the preliminary model development and evaluation of two flood control alternatives.

Task 6: Final Hydrologic and Hydraulic Model Development

The next task was to update and expand the HEC-RAS Hydraulic Model to include developing a calibrated HEC-RAS Existing Condition Model (ECM) as well as to calibrate the HEC-HMS hydrologic model. Project engineers walked the stream corridor to mark locations where additional topographic survey data was needed. Channel cross-sections were then surveyed. The survey data was then combined with aerial survey Photogrammetry data to update both the HEC-RAS and HEC-HMS ECMs.

An important component of finalizing flood control alternatives for Rohner Creek is improving the accuracy of the HEC-RAS ECM. Additional streamflow data was collected to improve the model calibration. Graham Mathews & Associates (GMA) under the direction of Winzler & Kelly (W&K) installed one gaging station consisting of a Campbell data collection platform, H-310 pressure transducer, solar panel, gage house, conduit and staff plate with crest gage to monitor streamflow on Rohner Creek near Beech Street along Stillman Way. Additionally, GMA installed 3 pairs of crest gages between Main Street and 12th Street. The streamgage went into operation on November 1, 2009 and is still being used to collect flow data. Data from the gages was downloaded monthly. The City of Fortuna monitors the three pairs of crest gages as well as a tipping bucket rain gage and provides monitoring data to Winzler & Kelly. The data obtained from GMA and the City was then used to calibrate the HEC-RAS ECM and the HEC-HMS ECM.

The preliminary modeling focused on analyzing two specific alternatives which included a detention basin on Fortuna High School property and a bypass channel. Under this task, the bypass channel by the High School will be further evaluated as well as several other in-channel and off-channel alternatives. The purpose of this task is to provide the City with a general understanding of the alternatives such that the desired alternative or set of alternatives from this task can be moved forward under a separate task into final analyses. The analyses under this task will focus on in- and off-channel alternatives.

The off-channel alternatives to be analyzed using the HEC-HMS model to investigate detention storage potential and the decrease of flood frequency and magnitude in Rohner Creek downstream of Main Street included:

- Expand/improve existing detention basin above Hillside Drive (Subbasin 10 and 11)
- New detention basin near pistol range east of rodeo grounds (Subbasin 8)

- New detention basin in upper watershed (Subbasin 1, 2 or 3)
- New bypass culvert/swale near Fortuna High School
- New bypass Culvert/swale along Fortuna Boulevard

Analysis of the three detention basin options shows the necessary size to accommodate the needed channel flows does not result in the desired improvements, thus none of the detention basin options are being considered for further evaluation. Both bypass options are currently under evaluation.

The in-channel alternatives are being analyzed in conjunction with the bypass options using the HEC-RAS ECM to investigate channel modifications that would improve flow conveyance between Main Street and 12th Street. The analyses include:

- Hypothetical removal/ modifications of bridge crossings
- Alteration in channel roughness through channel maintenance
- Channel widening/terracing

Once the alternatives discussed above are evaluated, they will be summarized in a letter report that will provide the City the informing needed to determine which set of alternatives should be considered for final evaluation and concept development.

Deliverables:

Letter Report describing the conceptual alternatives, aerial map of the alternatives, and summarizing the progress made and next steps. This study is currently underway and is anticipated to be completed

Task 7: Selection of Apparent Best Alternative

Under this task, the City will use the results of Task 6 to select a set of alternatives for further evaluation. This includes development of a set of alternative ranking criteria, including design storm flows, land requirements and rights of way, constructability, ease of operation and maintenance, public/environmental benefit, permitting, and costs. The apparent best alternative at a minimum will contain the 10-year storm between Main Street and 12th Street, and include channel modifications that allow for increased flow capacity and provide riparian habitat enhancement. The apparent best alternative may or may not include a bypass channel component.

As the alternatives are refined the HEC-RAS and HEC-HMS models will be utilized to evaluate specific channel improvements and the potential benefits of including one of the two bypass options in addition to the channel improvements. The HEC-RAS hydraulic model, developed by the Army Corps of Engineers (ACOE) is an industry standard hydraulic model that is regularly used for floodplain delineation by FEMA. The Rohner Creek watershed was hydrologically modeled using the ACOE HEC-HMS model. The current HEC-HMS model is an updated version of the HEC-1 model which was considered an industry standard. Thus, these models are appropriate for use in evaluating and designing channel improvements. An evaluation of easements needed to implement the project will be included in this task.

This task will be conducted in coordination with the environmental constraints analysis, and the results of the environmental constraints analysis will be used as one of the ranking criteria for selecting the apparent best alternative that is self mitigating and can be permitted by the regulatory agencies.

The final result of this task will be a complete description of the apparent best alternative. This includes preparing preliminary calculations and estimated costs, and addressing major issues affecting budget, construction phasing, prioritization and schedule.

Deliverables:

Stormwater Control and Riparian Habitat Project Conceptual Layout Report

Task 8: Environmental Constraints Analysis

Under this task, each of the City's preliminary alternatives included in the selection of the apparent best alternative will be evaluated for environmental constraints and environmental agency permits that may be needed will be identified. Environmental constraints will be identified using the CEQA checklist. CEQA areas of particular interest to this project include biological resources, geology and soils, hydrology and water quality, and utilities and services system. While CEQA will be performed on the apparent best alternative, and all impacts mitigated as necessary, the section mentioned above are most likely to impact the feasibility of an alternative. Potential permits include a Dept. of Fish and Game Section 1600 Permit, ACOE Section 404 permit, and Regional Board Water Quality 401 Certification. Potential additional studies to support Section 7 Consultation including a Federal Biological Assessment (BA) for federally listed species such as Coho Salmon would be necessary as well as Take Avoidance measures for State listed species to support a Dept. of Fish and Game Consistency Determination.

Deliverables:

Environmental Constraints Summary Table to be included with the Task 7 Deliverable

Task 9: Preliminary Design

Under this task, the project design to the 30% level of completion will be conducted. This task includes final project surveying, a geotechnical analysis, geomorphic assessment and a 30% set of project plans and opinion of construction cost. One of the purposes of this task is to develop the project to the point where the design can be presented to regulatory agencies for input, including the Regional Board, Dept of Fish and Game, and ACOE.

A survey of the project site will be conducted to collect any remaining topographic data necessary for design of the channel improvements and to support land acquisition (if necessary) and development of easements.

The preliminary alignment of improvements, indication of identified utilities requiring relocation, and incorporation of appropriate issues known to be required for environmental documents will be included on the plans.

Deliverables:

11 x 17 Preliminary Design Plan Set and Opinion of Probable Cost, which incorporate review comments from city staff and regulatory agencies.

Task 10: Final Design

This task includes development of design deliverables at the 75%, 95%, and 100% plan sets. At each level of completion a set of design plans, specifications, probable opinion of cost, and schedule will be prepared.

Based on the preliminary design, the 75% Construction Document plans and specifications will be prepared. The Construction Document plans and specifications shall include civil, structural, mechanical, survey and geotechnical work associated with completing the construction work. An Opinion of Probable Cost based on the 75% Working Drawings submittal identifying quantities, unit costs, and total construction costs will be prepared. The opinion shall be based on the draft Bid Schedule and Measurement and Payment sections of the specifications. Utility companies shall be contacted if relocations or new service are considered at this stage, and known issues resolved with the appropriate agencies, potentially including PG&E, AT&T, and the City's own water and wastewater departments. All drawings shall be prepared in AutoCAD and plotted in 11" x 17" size. All specifications shall be CSI format, 8½" x 11" size. The 75% deliverable will be routed to appropriate regulatory agencies for review and comment.

A 95% submittal will be prepared based on the 75% submittal and comments from review agencies. This deliverable includes a complete design of all improvements, specifications, and estimated construction costs. Utility coordination is clear and ready to be initiated. Earthwork and riparian channel improvement will be finalized. Any permit conditions and/or environmental mitigations will be incorporated into the plans and specifications. The bid package is essentially complete with the exception of a date for advertisement and bid opening.

Based on the review of the 95% submittal, the 100% Construction Document plans and specifications will be prepared. A final engineer's construction cost estimate will be prepared based on the final Bid Schedule and Measurement and Payment sections of the specifications. All labor costs estimated shall be based upon State prevailing wage rates. The 100% Plans, Specifications and Estimate are finalized, signed and stamped, and ready for bid.

Deliverables:

75% Design Plans, Specifications, Opinion of Cost, and Schedule

95% Design Plans, Specifications, Opinion of Cost, and Schedule

100% Design Plans, Specifications, Opinion of Cost, and Schedule

Task 11: Environmental Documentation

Under this task the CEQA document for the project will be completed. It is likely that a mitigated negative declaration (MND) will be the appropriate environmental document for the project. It is anticipated that potential impacts can be mitigated to less than significant. The City of Fortuna would be the lead agency.

An Initial Study per CEQA Guidelines Section 15063 will be prepared. Necessary consultations will be conducted and an MND per CEQA guidelines Article 6 (Sections 15070 through 15075) will be developed. Once the document is complete a the MND will be circulated for review. Comments will be reviewed and modification made if necessary.

A final MND and Mitigation Monitoring and Reporting Program and Compliance Checklist will be prepared and the document will be considered for adoption by the City, and once approved a notice of determination will be filed with Humboldt County and the State Clearinghouse.

The project will not occur on Federal land, nor have federal dollars been obtained to fund the project, therefore National Environmental Policy Act (NEPA) will not be completed for this project.

Deliverable: Approved and Adopted CEQA Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program and Compliance Checklist; Notice of Determination Filed with the State Clearinghouse

Task 12: Permitting

Under this task, the appropriate permitting agencies will be contacted to determine the permit requirements for the flood control measures. Possible permitting requirements from the following are assumed: Department of Fish and Game (section 1600 permits), the North Coast Regional Water Quality Control Board (401 Water Quality Certification and a Stormwater Pollution Prevention Plan), and the U.S. Army Corps of Engineers (Section 404 Permit) and dependent upon the final design approach. The City will obtain a grading permit in according with the City Building Department regulations. Application packages for each agency will be developed and submitted plus follow up phone calls and field evaluations with agency representatives will be conducted. Channel habitat improvements are included in part as mitigation for potential project impacts. The mitigations requested by permitting agencies will be incorporated into the CEQA documents and project plans and specifications.

Deliverables: Permit approval letters from the Regional Board (Water Quality Certification, SWPPP), Army Corps of Engineers (Section 404 permit) and Department of Fish and Game (Section 1600 permit), City building permit.

Budget Category (d): Construction/Implementation

Task 13: Construction Contracting

Under this task, the advertisement and contract documents will be prepared for construction contract bidding. This task includes the preparation of the bid package including final plans and specifications; advertising the bid opening in the local paper as well as local and regional builder's exchanges; providing bid package to interested contractors; replying to all contractors with any questions submitted during the bid period; conducting the pre-bid meeting; analyzing bids based on cost and contractor qualifications; reviewing low bidder required documentation including equal employment documentation if required, the contractor's license, and the bid bond; and making the final contractor recommendation.

Deliverables: Advertisement for bids; pre-bid meeting minutes; evaluation of bids; award of contract; notice to proceed

Task 14: Construction

Subtask 14.1 Mobilization and Site Preparation

Mobilization by the contractor will be a bid item in the construction contract publicly bid for the construction of the project and will include all contractor costs and effort associated with mobilizing equipment, materials, and labor to the project site. Items covered by this include, but are not limited to, bonds, insurance, contracting and administrative costs, costs associated with temporary facilities and utilities.

Site preparation that will be completed by either the City or the Contractor depending on the final design and construction schedule will include protection or relocation of existing City facilities as needed, clearing of vegetation in advance of the typical construction season to meet permit conditions, development of access roads and materials storage areas, set up of fencing to protect environmentally sensitive areas and or fish re-location prior to dewatering activities.

Subtask 14.2 Project Construction

Project construction will include the various items included in the publicly bid construction contract including traffic control during work on City Streets, construction staking to locate the principle areas of work and establish lines and grades during construction, setting and maintaining a water diversion during work in the channel of Rohner Creek, the set up and maintenance of erosion and sediment control measures, demolition of existing infrastructure to be removed to make way for construction activities, clearing and removal of vegetation including existing debris jams within the channel, excavating of the channel to increase the flow area within the channel, replacement of four existing vehicle bridges at narrow points in channel with longer bridges capable of spanning the new wider channel width, stabilization of the channel after excavation using the placement of rock slope protection or vegetated methods, grading and of the creek channel, placement of clean gravel backfill in channel after excavation is complete, construction of cast-in-place concrete floodwalls outside of the top of

bank, construction water diversion structure for intake bypass channel, or construction of pre-cast or cast in place reinforced concrete box culverts or graded bypass channel, installation of fisheries habitat enhancements including woody debris, boulder structures and rock weirs, construction of cast in place outlet structure at downstream and placement of rock or concrete energy dissipater, grade control structures downstream of the outlet structure to improve the grades of the existing culvert outfall to meet current fish passage criteria for juvenile and adult salmonids.

Subtask 14.3 Performance Testing and Demobilization

This task will occur at the end of the construction project. Under this task, project components will be inspected to establish that work is complete. A final punch list will be developed which identifies all remaining construction items to be completed. The operation of the bypass channel if installed will be tested.

Demobilization by the contractor will include punch list items, repairs of damaged property, site cleanup, removal of all unused materials and equipment from the site, and warranty. Demobilization by the City will include removal of fencing used to protect environmentally sensitive areas and any post construction monitoring required by the regulatory permits or environmental mitigations.

The City will continue to maintain the crest gauges and stream flow monitoring equipment after the project is complete for a period of no less than five years so that effectiveness of the project can be measured. During storm events of a significant recurrence interval that result in bank full discharge, the flow in the channel will be measured and the capacity confirmed relative the results predicted by the post-project hydraulic model. During storm events that cause overbank flow, the general extents of flooding will be mapped and compared to the pre-project flooding so that the reduction in flood area can be measured.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 15: Re-vegetation Planting and Monitoring Plan

This task will include the development of a re-vegetation planting and monitoring plan. The plan will be developed by a plant ecologist in concert with a geomorphologist and hydraulic engineer. The plan will detail the species, densities and locations of the native riparian plants and trees within the corridor. The re-vegetation plan will be developed following the protocol outlined in the CDFG California Salmonid Stream Habitat Restoration Manual, Section 11. Under this task, the City will contract re-vegetation work with a reputable ecological restoration organization to ensure successful implementation. Verify that plants used are propagated from locally collected native plant materials. The re-vegetation will occur when the site has been prepared and when the soil has been sufficiently wetted with seasonal rain. Once complete, the re-vegetation will be reviewed by the construction observer and any deficiency corrected before the project notice of completion is issued. The plan will also include long term (minimum 10-years) of vegetation monitoring to ensure the planted riparian habitat areas are meeting the success criteria and supporting achievement of project objectives. The project has been conceptually developed with the intent to be self mitigating therefore temporal

impacts to aquatic and riparian habitats during construction will be mitigated by design of the improved corridor. No offsite mitigation is anticipated.

Task 16: Stormwater Pollution Prevention Plan (SWPPP) Implementation

This task includes the items necessary to implement the project SWPPP including: File Notice of Intent electronically with the SWRCB and upload the SWPPP to the SMART database; Conduct visual site inspections according to the SWPPP, including pre-storm inspections, extended storm monitoring, post-storm monitoring, weekly routine monitoring, and quarterly non-storm discharge monitoring; Submit storm event monitoring results to the SMART database.

Deliverables:

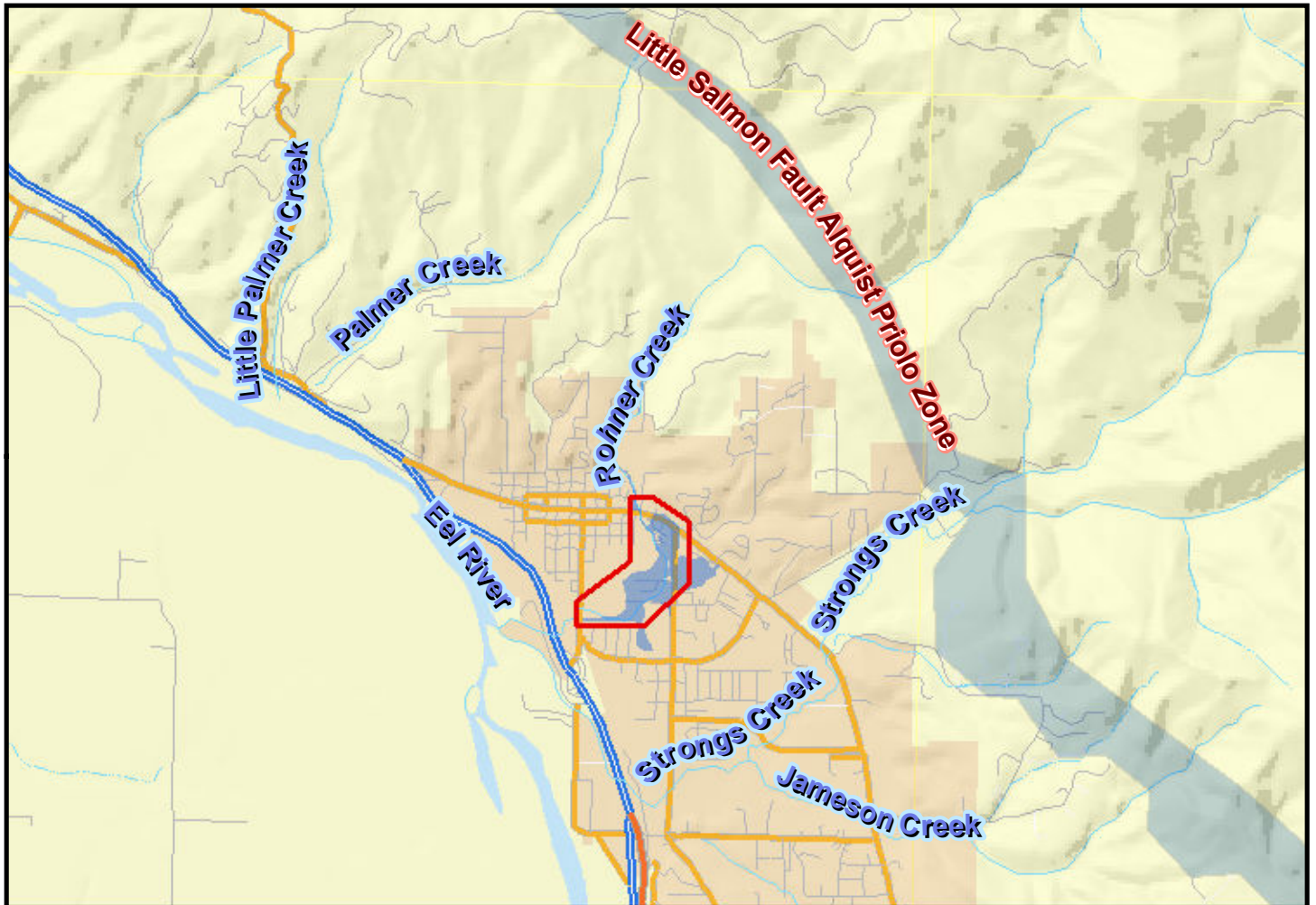
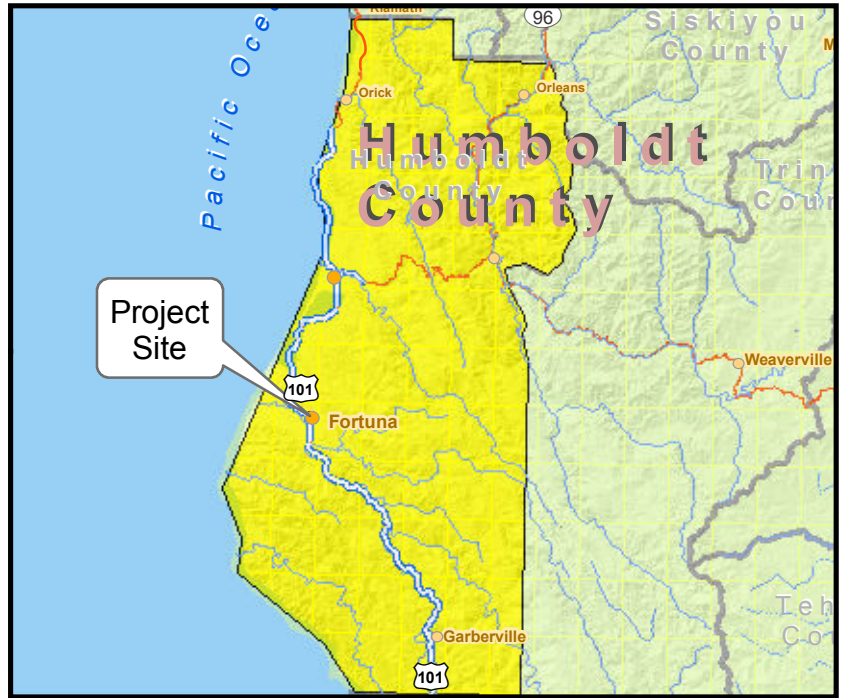
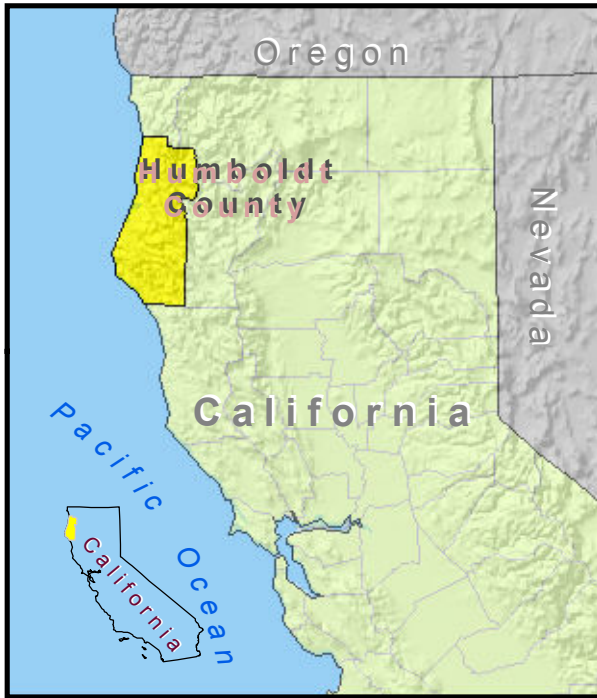
All SWPPP data will be uploaded to the State's SMART database, no separate deliverable will be provided for this task.

Budget Category (f): Construction Administration

Task 17: Construction Administration

Construction administration activities will be performed by City staff with the assistance of a consultant hired to complete construction engineering and inspection services. Construction administrative tasks will include:

1. Conducting a pre-bid meeting to review the requirements for bidding with prospective bidders
2. Conducting a preconstruction meeting to review project requirements
3. Review of documents to be submitted by the contractor, including bonds and insurance, public noticing requirements, labor compliance documentation, etc.
4. Complete daily on-site inspection and weekly progress reports
5. Verify construction work is consistent with the intent of plans and specifications
6. Verify compliance with required environmental mitigation measures and permit requirements
7. Measure quantities of work completed and recommend payment to contractor by City
8. Attend regular construction meetings
9. Prepare and distribute public information bulletins or updates
10. Review and respond to contractor submittals
11. Review contractor documents for compliance with public contract requirements, labor requirements and health and safety requirements
12. Provide construction staking to locate components of work
13. Perform materials testing to confirm suitability of materials to be incorporated into the project
14. Prepare project closeout documentation including punch lists, final budget summary, change order summary and other pertinent data from project
15. Complete record drawings of project detailing any changes from original plans
16. Prepare recommendations concerning final payments to contractors and release of retained percentages and bonds
17. Prepare a notice of completion and file with county require



Project Boundary



100 Year Flood



Stream



River



U.S. Highway



Major Road



Local Roads



0 0.5 1 Miles

1 inch = 1 miles printed at 8.5x11

Sources: NOAA Fisheries: Aerial 2009 0.5 meter resolution;
StreetMap USA - TeleAtlas



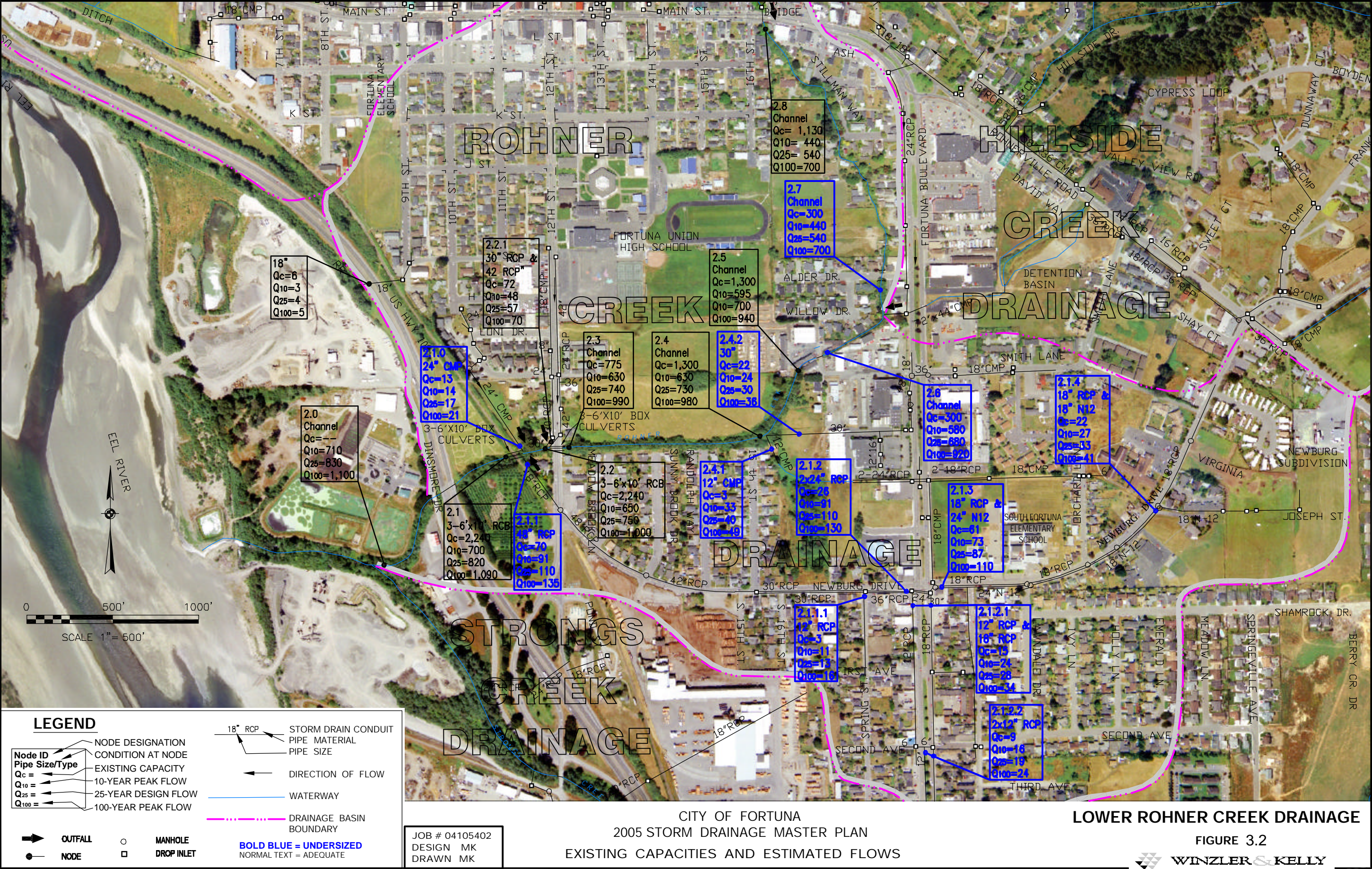
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**Figure 3.1
Regional Map**

City of Fortuna
Rohner Creek Flood Control
Enhancement Project



Excerpt from:

Humboldt County Operational Area Hazard Mitigation Plan; Volume 1—Planning Area-Wide Elements...

13.3.3 Frequency

The Humboldt County planning area has experienced at least nine seismic events with a magnitude of 5.0 or higher in a 7-year period (see Table 13-5). The USGS has created probabilistic hazard maps based on peak ground acceleration that takes into account new information on several fault zones. The northern California area, including Humboldt County, is in a high-risk area, with a 10-percent probability in a 50-year period of ground shaking from a seismic event exceeding 30 percent of gravity. Figure 13-4 shows the expected peak horizontal ground motions for this probability (USGS Website, 2007).

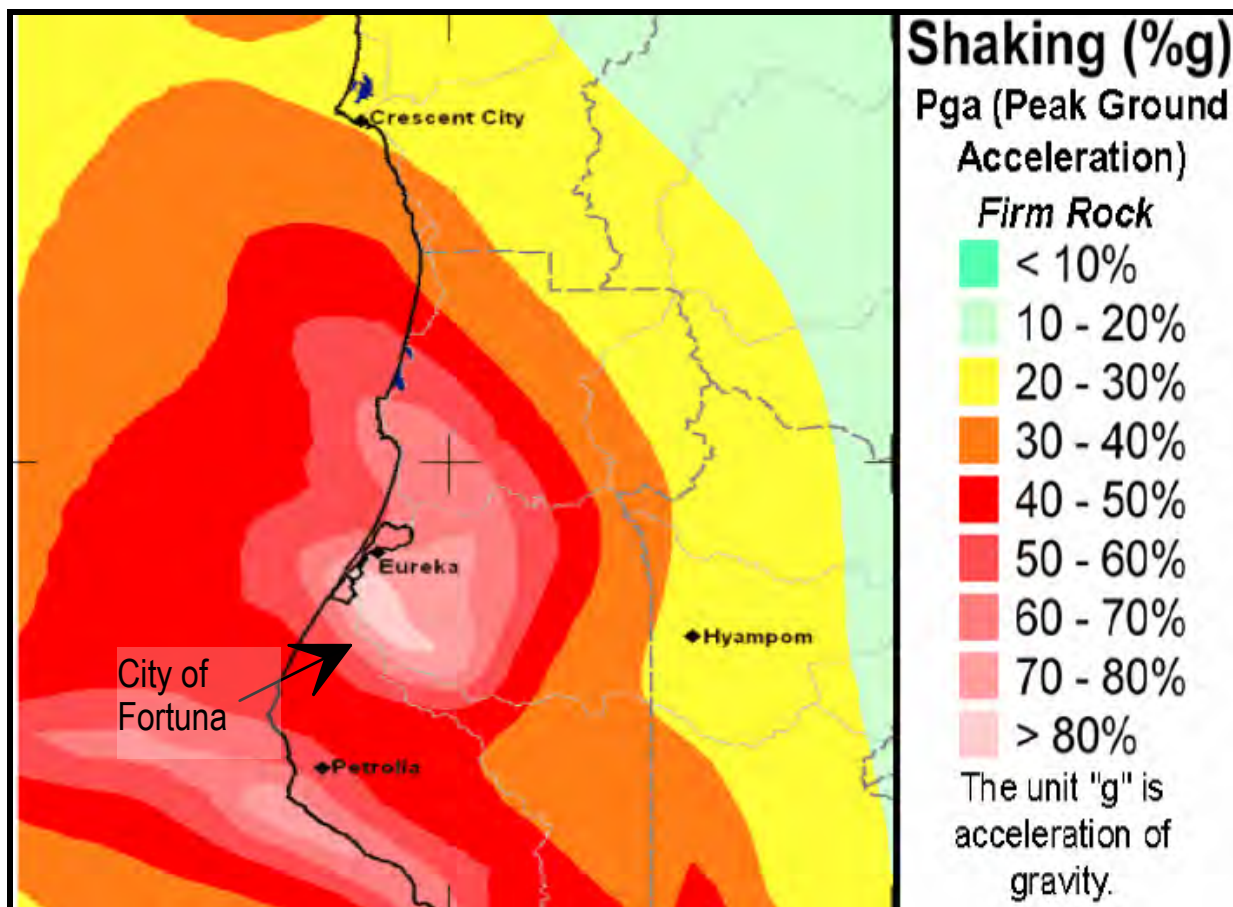


Figure 13-4: Probabilistic Hazard Map

13.3.4 Severity

The severity of an earthquake can be expressed in terms of both intensity and magnitude. Intensity is based on the observed effects of ground shaking on people, buildings, and natural features. It varies from place to place within the disturbed region depending on the location with respect to the earthquake epicenter. Magnitude is related to the amount of seismic energy released at the hypocenter of the earthquake. It is based on the amplitude of the earthquake waves recorded on instruments, which have a common calibration. Magnitude is thus represented by a single, instrumentally determined value.

Past events suggest that earthquakes typical for the Humboldt County planning area would cause light to moderate damage. However, severity can increase based on soil type and proximity to the hypocenter of the event. There are soft soils in Humboldt County that have a high degree of vulnerability to earthquakes. USGS estimates that there is at least a 5-percent probability an earthquake with a magnitude

